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ABSTRACT

The present invention provides a novel silk-fiber-based matrix having a wire-rope geometry for use in producing a ligament or tendon, particularly an anterior cruciate ligament, *ex vivo* for implantation into a recipient in need thereof. The invention further provides the novel silk-fiber-based matrix which is seeded with pluripotent cells that proliferate and differentiate on the matrix to form a ligament or tendon *ex vivo*. Also disclosed is a bioengineered ligament comprising the silk-fiber-based matrix seeded with pluripotent cells that proliferate and differentiate on the matrix to form the ligament or tendon. A method for producing a ligament or tendon *ex vivo* comprising the novel silk-fiber-based matrix is also disclosed.

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